

## PATENT ABSTRACTS OF JAPAN

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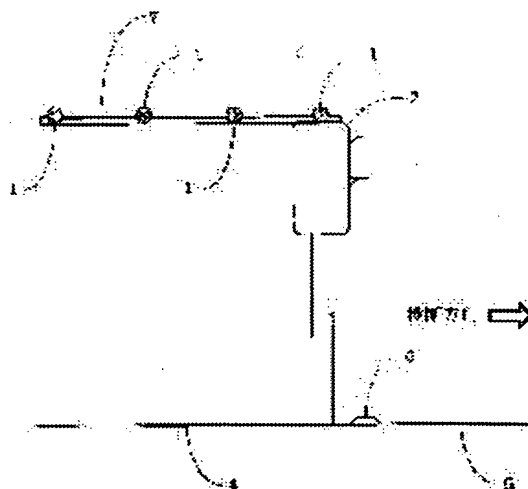
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ICHIKAWA YOSHIE**(54) METHOD FOR ARRANGING ACOUSTIC TRAFFIC SIGNAL ADDING DEVICE FOR VISUALLY HANDICAPPED PERSON GUIDANCE****(57)Abstract:**

**PROBLEM TO BE SOLVED:** To solve the problem that a conventionally spread acoustic traffic signal adding device for guiding the road crossing of a visually handicapped person needs to store combinations of allowed crossing directions and sounds assigned thereto and is very dangerous in case of an error in storage or a mistake and a sound is very loud and exerts adverse influence on the living environment of neighbors and is an obstacle to the spreading of the device since the handicapped is guided to cross by hearing the sound from the opposite side across the road.

**SOLUTION:** Plural sound devices are arranged at each traffic signal installation place in parallel to the crossing direction of pedestrians and made to sound sequential order from one side to the other when pedestrians are allowed to cross, thus letting them know the crossing direction. This method and the installation of rib type section lines are combined together to obtain a method for guiding the road crossing of a visually handicapped person.

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[0010] Here, in a case that there are two acoustic devices, when the sound is played continuously, recognition of the transitable direction becomes difficult. By providing a certain interval after playing the sound in the side close to a road following the side away from the road, the transitable direction recognition of the transitable direction can be facilitated. Separately from the above method, the recognition of the transitable direction can be facilitated by controlling two acoustic devices with the stereo system, and by dynamically move the sound source from the side away from the road to the side close to the road.

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**CLAIMS**

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[Claim(s)]

[Claim 1] The sound type traffic-signal additional-equipment configuration method for the visually impaired person induction which tells the direction which can be crossed by arranging two or more sound equipments to a pedestrian's crossing direction and parallel, and sounding these from one side one by one to another side for every traffic-signal installation part when a pedestrian's crossing is possible.

[Claim 2] The method according to claim 1 of arranging sound equipment in the foot-walk section or the driveway road-shoulder section, and performing it.

[Claim 3] A visually impaired person's road crossing induction approach of using together installing the rib type carriageway marking which shows a travelling direction on an approach according to claim 1, and a foot walk and a zebra zone, and performing it.

[Claim 4] A visually impaired person's road crossing induction approach of using together installing the rib type carriageway marking which shows a travelling direction on an approach according to claim 2, and a foot walk and a zebra zone, and performing it.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the configuration of the sound type additional equipment attached in a traffic signal for the purpose of guiding a visually impaired person's road crossing.

[0002]

[Description of the Prior Art] There are cry types (cuckoo etc.), melody types (passage \*\*\*\*\*)

etc.), etc. in the sound type additional equipment conventionally attached in a traffic signal in order to guide a visually impaired person's road crossing, a cry different, respectively, a melody different, respectively, etc. are assigned for every direction of east and west and north and south, a sound is emitted from the both sides of a road, and the direction which can be crossed is told. For example, when crossing of the direction of east and west was possible, it sounded with KAKKO, and when crossing of the direction of north and south is possible, it has sounded with PIYOPIYO. In addition, as for the combination of the direction and sound which can be crossed, the fixed regulation is defined for every all prefectures.

[0003]

[Problem(s) to be Solved by the Invention] However, according to this approach, it is very dangerous when the storage difference in the combination of the direction and sound which can be crossed is carried out.

[0004] Although it generally tends to mistake with what can judge the direction which can be crossed that what is necessary is just to progress toward that direction if the sound from the opposite side of a road can be heard even if it has not memorized this combination In practice, since a sound is emitted by coincidence from four signal installation parts within a crossing, a sound cannot distinguish the direction which can be crossed only by a direction not being shown and hearing a sound.

[0005] Therefore, the fixed regulation is defined for every all prefectures so that this combination may be memorized and translated, but it is not being able to perform simply a visually impaired person judging the direction of east and west, and the direction of north and south itself, and since it is not realistic, it cannot be said to be the equipment which is easy to use for a visually impaired person to distinguish the method of an intersectional crossover only in the direction of east and west and the direction of north and south.

[0006] Moreover, the direction which can be crossed was made easy to judge by telling the sound from the signal of the opposite side of a road, and in order to guide crossing, the loud sound interrupted by neither the noise of a vehicle nor the sound of a wind is emitted. For this reason, there is much equipment which has suspended the function in Nighttime from consideration of neighboring residents' living environment. However, a visually impaired person can judge the timing of crossing, and a direction also from a motion of other passersby, the transit sound of a vehicle, and the stopped idling sound of \*\*\*, and since it is a time zone with few the traffic of Nighttime when the basis of such decision becomes scarce and the traffics of a vehicle that it is risk most, the present condition is not functioning [ which is the need truly ] by the way.

[0007] In addition, it is also the big hindrance of spread that a sound exerts trouble on neighboring residents greatly.

[0008]

[Means for Solving the Problem] Then, for every traffic-signal installation part, this invention has arranged two or more sound equipments to a pedestrian's crossing direction and parallel, is sounding these from one side one by one to another side, when a pedestrian's crossing is possible, and made them the approach of telling the direction which can be crossed.

[0009]

[Embodiment of the Invention] The fundamental gestalt which carries out this invention is arranging two or more sound equipments, and sounding from a side far from a driveway in order to a near side through a control unit to a pedestrian's crossing direction and parallel, at the upper part of the foot walk in which the light-for-pedestrians machine's is installed, or the driveway road shoulder, or underground, when a light-for-pedestrians machine's is blue, and is structure which tells the direction which can be crossed to a visually impaired person.

[0010] The direction which can be crossed is made easy to recognize spacing fixed [ after sounding a near side following a side far from a driveway ] since it will be hard coming to recognize the direction which can be crossed here if a sound is sounded continuously when the number of sound

equipments is two by Lycium chinense. The direction which controlling two sound equipments by the stereo system, and moving a sound to a near side dynamically from a side far from a driveway apart from this can also cross can be made easy to recognize.

[0011] Moreover, migration of a sound can be made easy to recognize by changing the tone of the sound emitted from each sound equipment, and a musical interval, although it is about how to sound a sound.

[0012] In addition, it is telling that a light-for-pedestrians machine changes a signal to those who change blue into a flashing condition and cross before changing from blue to red. Also when sounding the equipment by this invention, it can guide to insurance more by controlling to tell that shorten spacing from which a sound sounds and it moves in a blue flashing condition, and a signal changes to a visually impaired person.

[0013] Next, although it is the concrete configuration method of sound equipment, hereafter, an example is shown in an accompanying drawing and it explains to it. Drawing 1 is the example 1 of this invention, and arranges sound equipment 1 in the upper part of the light-for-pedestrians machine 2, and the upper part of a stanchion 3 built at the foot-walk edge. Here, a stanchion 3 is built so that the line which ties two sound equipments may become the crossing direction and parallel.

[0014] Drawing 2 is the example 2 of this invention, and is arranged to the overhang member 7 which attached sound equipment 1 in the upper part of the light-for-pedestrians machine 2. [ two or more ] At this time, the overhang member 7 is attached so that it may become the crossing direction and parallel. Moreover, the number of sound equipment 1 and the die length of the overhang member 7 take into consideration the width of face of the foot-walk section, and the situation of the neighboring structure, and decide them appropriately to be able to judge the direction which can be crossed by migration of a sound.

[0015] Drawing 3 is the example 3 of the equipment by this invention, and is arranged to the receptacle member 8 which attached sound equipment 1 in the lower part of the light-for-pedestrians machine 2. [ two or more ] An example 3 is the short form of an example 2, and has spatial limits, such as a driveway road shoulder in case there are not a part where the width of face of a foot walk is narrow, and a foot walk, and traffic is the example installed in the part where a visually impaired person tends to approach equipment few.

[0016] Although the example is shown as the lower part in the upper part of the light-for-pedestrians machine 2, and drawing 3 about the location which arranges sound equipment 1 in drawing 1 R> 1 and drawing 2, since the height of the light-for-pedestrians machine 2 is various, it does not limit with the upper part or the lower part, respectively. Moreover, you may lay underground on the way.

[0017] Drawing 4 is a synthetic example of a configuration for guiding a visually impaired person's road crossing using an example 1 and rib type carriageway marking. Rib type carriageway marking is carriageway marking for road surface display which has the heights currently used for the flash forbidden line of a vehicle etc. Since the equipment by this invention can tell the direction which can be crossed only to the sound of the equipment of one side of a road, it is effective to a comparatively small sound, and the sound of the opposite side does not need to be heard. Therefore, it is hard for a visually impaired person to grasp an exact travelling direction in the case of road crossing. In the case of the conventional approach, induction of a travelling direction is measured by telling the sound of the opposite side about this point, but since the sound of four places within a crossing can be heard in fact, effectiveness is low.

[0018] An example 4 is an example of a configuration for solving this problem, and with the induction rib type carriageway marking 9 and 9a, the visually impaired person who has walked the foot walk has a foot-walk top guided, and stands by on foot-walk edge display rib type carriageway marking 9b and 9c. If the light-for-pedestrians machine 2 becomes blue, the direction which can be crossed with the equipment (example 1) by this invention is told, and zebra zone 10 and 10a top can be

correctly crossed according to induction of the crossing induction rib type carriageway marking 9d and 9e installed on the zebra zone.

[0019] In addition, 9, 9a, 9d, and 9e consist of one line, and it serves to guide a visually impaired person, and 9b and 9c shall be constituted considering two lines as one, and shall serve to show a visually impaired person cautions and warning.

[0020]

[Effect of the Invention] Since this inventions are the above configurations, the following effectiveness produces them. Since the direction which can be crossed can be directly told in the first place not related in a direction to a visually impaired person, it becomes unnecessary to memorize like before the combination of a sound and the direction which can be crossed, and the risk by storage difference is canceled.

[0021] The need of second stopping equipment in night since the direction which can be crossed only with the equipment of one side of a road can be told and it becomes effective to a sound smaller than before decreases, and the trouble to neighboring residents is also mitigated, and it becomes easy to spread.

[0022]

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## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the example 1 of this invention.

[Drawing 2] It is the example 2 of this invention.

[Drawing 3] It is the example 3 of this invention.

[Drawing 4] It is the example 4 of this invention.

[Description of Notations]

1 Sound Equipment

2 Light-for-Pedestrians Machine

3 Stanchion

4 Foot Walk

5 Driveway

6 Step Driveway Stone of Demarcation

7 Overhang Member

8 Receptacle Member

9 Induction Rib Type Carriageway Marking

9a Induction rib type carriageway marking

9b Foot-walk edge display rib type carriageway marking

9c Foot-walk edge display rib type carriageway marking

9d Crossing induction rib type carriageway marking  
9e Crossing induction rib type carriageway marking  
10 Zebra Zone Line  
10a Zebra zone line

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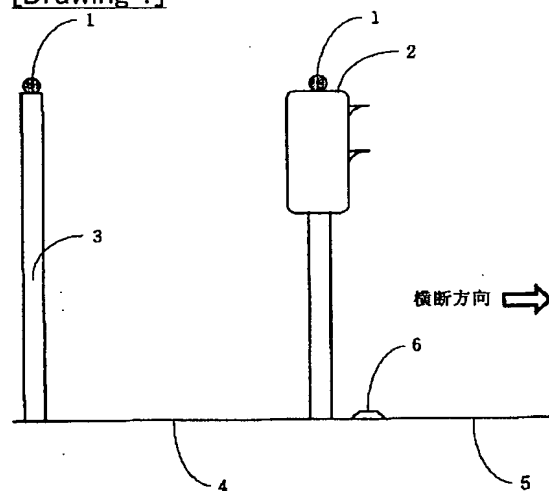
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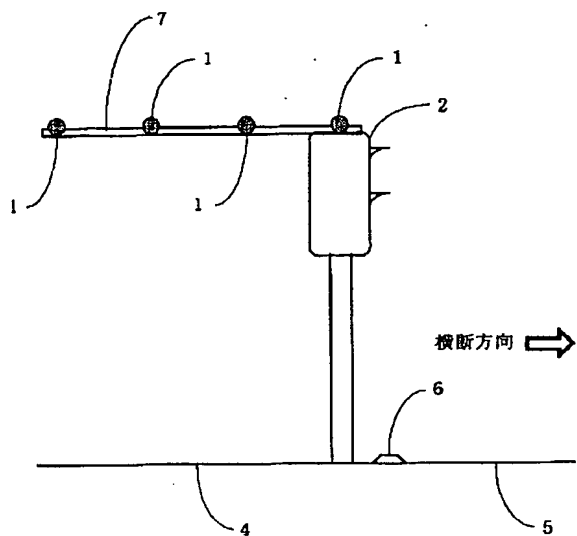
DRAWINGS

[Drawing 1]

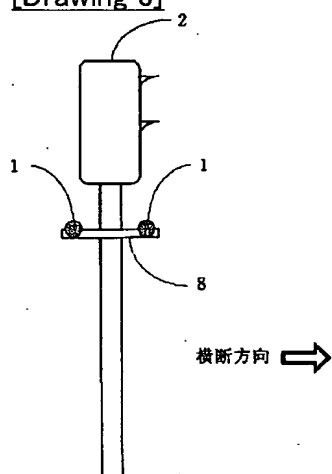


[Drawing 2]

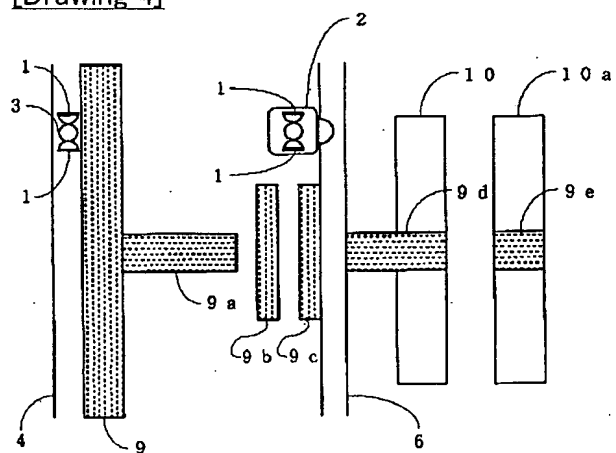




[Drawing 3]



[Drawing 4]



[Translation done.]

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EA12 EA13 EA22

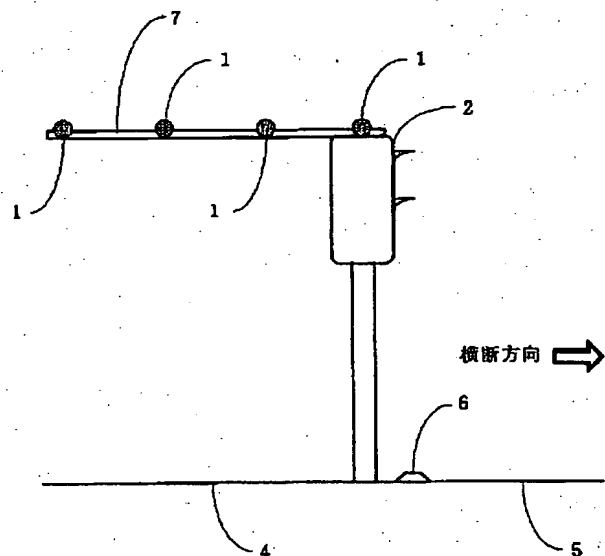
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(54) 【発明の名称】 視覚障害者誘導のための音響式交通信号機付加装置配置方法

(57) 【要約】

【課題】 従来より普及している、視覚障害者の道路横断を誘導するための音響式交通信号機付加装置は、横断可能な方向とこれに割り当てられた音との組合せを記憶する必要があり、記憶違い、錯誤があると非常に危険であった。また、道路の反対側の音も聞かせることで横断を誘導しようとするので、音が非常に大きく、近隣住民の生活環境に害を及ぼし普及の妨げとなっている。

【解決手段】 交通信号機設置箇所ごとに、歩行者の横断方向と平行に複数の音響装置を配置し、これらを歩行者の横断が可能である時に一方から他方へ順次鳴らすことで、横断が可能である方向を知らせる方法とした。また、この方法とリブ式区画線の設置を組み合わせ、視覚障害者の道路横断を誘導する方法とした。



**【特許請求の範囲】**

【請求項1】 交通信号機設置箇所ごとに、歩行者の横断方向と平行に複数の音響装置を配置し、これらを歩行者の横断が可能である時に一方から他方へ順次鳴らすことで、横断が可能である方向を知らせる視覚障害者誘導のための音響式交通信号機付加装置配置方法。

【請求項2】 音響装置を歩道部または車道路肩部に配置して行う、請求項1記載の方法。

【請求項3】 請求項1記載の方法と、歩道及び横断歩道上に進行方向を示すリブ式区画線を設置することを併用して行う、視覚障害者の道路横断誘導方法。

【請求項4】 請求項2記載の方法と、歩道及び横断歩道上に進行方向を示すリブ式区画線を設置することを併用して行う、視覚障害者の道路横断誘導方法。

**【発明の詳細な説明】****【0001】**

【発明の属する技術分野】この発明は、視覚障害者の道路横断を誘導することを目的として交通信号機に取り付ける音響式付加装置の構成に関するものである。

**【0002】**

【従来の技術】従来より、視覚障害者の道路横断を誘導する目的で交通信号機に取り付ける音響式付加装置には、鳴き声式（カッコウ等）とメロディー式（とおやんせ等）などがあり、東西と南北の方向ごとに、それぞれ異なった鳴き声やメロディーなどを割り当てて、道路の両側から音を発し、横断が可能である方向を知らせている。例えば、東西方向の横断が可能なのはカッコーと鳴らし、南北方向の横断が可能なのはピヨピヨと鳴らしている。なお、横断が可能である方向と音との組合せは、各都道府県ごとに一定の規則が定められている。

**【0003】**

【発明が解決しようとする課題】しかしながら、この方法によると、横断が可能である方向と音との組合せの記憶違いをした場合、非常に危険である。

【0004】一般的に、この組合せを記憶していなくても、道路の反対側からの音が聞こえれば、その方向に向かって進めば良く、横断が可能である方向が判断できるものと錯誤しがちであるが、実際は、交差点内にある4箇所の信号機設置箇所から同時に音が発せられるため、音が方向を示すことはなく、音を聞くだけで横断可能な方向を判別することはできないのである。

【0005】そのため、この組合せを記憶しやすくするよう、各都道府県ごとに一定の規則を定めているのであるが、視覚障害者が東西方向、南北方向を判断すること自体が簡単にできることではないし、交差点の交差の仕方を東西方向と南北方向のみで区別するのは現実的でない。視覚障害者にとって利用しやすい装置とは言えない。

【0006】また、道路の反対側の信号機からの音も聞かせることにより、横断可能な方向を判断しやすくし、

かつ、横断の誘導をしようとしているため、車の騒音や風の音にも遮られないだけの大きな音を発している。このため、近隣住民の生活環境への配慮から夜間においては機能を停止している装置が多い。しかし、視覚障害者は他の通行人の動き、車の走行音及び停車している車のアイドリング音からも横断のタイミング、方向を判断する事が可能であり、最も危険なのはそのような判断の根拠が乏しくなる夜間の人通り及び車の通行量が少ない時間帯であるので、本当に必要な時に機能していないのが現状である。

【0007】加えて、音が大きく近隣住民に迷惑を及ぼすことは、普及の大きな妨げにもなっている。

**【0008】**

【課題を解決するための手段】そこで本発明は、交通信号機設置箇所ごとに、歩行者の横断方向と平行に複数の音響装置を配置し、これらを歩行者の横断が可能である時に一方から他方へ順次鳴らすことで、横断が可能である方向を知らせる方法とした。

**【0009】**

【発明の実施の形態】本発明を実施する基本的な形態は、歩行者用信号機が設置されている歩道もしくは車道路肩の上部もしくは地中に、歩行者の横断方向と平行に、複数の音響装置を配置して、歩行者用信号機が青の時に、制御装置を介して、車道に遠い側から近い側へ順に鳴らすことで、視覚障害者に対して横断可能な方向を知らせる仕組みである。

【0010】ここで、音響装置が2個の場合、音を連続して鳴らすと横断可能な方向が認識しづらくなるので、車道に遠い側に続いて近い側を鳴らした後に一定の間隔をおくことで、横断可能な方向を認識しやすくする。これとは別に、二つの音響装置をステレオ方式で制御して、車道に遠い側から近い側へ音を動的に移動させることでも、横断可能な方向を認識しやすくすることができる。

【0011】また、音の鳴らし方についてであるが、個々の音響装置から発する音の音色、音程を変えることで音の移動を認識しやすくすることができる。

【0012】なお、歩行者用信号機は、青から赤へ変わる前に青を点滅状態にして、横断する者に対し信号が変わることを知らせている。本発明による装置を鳴らす場合も、青の点滅状態の時には、音が鳴り移る間隔を短くして、視覚障害者に対し信号が変わることを知らせるよう制御することで、より安全に誘導が行える。

【0013】次に、音響装置の具体的な配置方法であるが、以下、添付図面に実施例を示して説明する。図1は、本発明の実施例1であり、音響装置1を、歩行者用信号機2の上部と、歩道端に建てた支柱3の上部に配置している。ここで、支柱3は、2つの音響装置を結ぶ線が横断方向と平行になるように建てる。

【0014】図2は、本発明の実施例2であり、音響装

置 1 を、歩行者用信号機 2 の上部に取り付けた張り出し部材 7 に複数個配置している。この時、張り出し部材 7 は横断方向と平行になるよう取り付け。また、音響装置 1 の個数及び張り出し部材 7 の長さは、歩道部の幅、近隣構造物の状況を勘案し、音の移動によって横断可能な方向が判断できるよう適切に決める。

【0015】図 3 は、本発明による装置の実施例 3 であり、音響装置 1 を、歩行者用信号機 2 の下部に取り付けた受け部材 8 に複数個配置している。実施例 3 は実施例 2 の簡易型であり、歩道の幅が狭い箇所、歩道の無い場合の車道路肩など空間的な制限があり、かつ、人通りが少なく視覚障害者が装置に近づきやすい箇所に設置する例である。

【0016】音響装置 1 を配置する位置について、図 1、図 2 においては歩行者用信号機 2 の上部、図 3 においては下部として実施例を示しているが、歩行者用信号機 2 の高さは様々であるので、それぞれ上部または下部と限定するものではない。また、途中に埋設しても良い。

【0017】図 4 は、実施例 1 とリブ式区画線を利用した、視覚障害者の道路横断を誘導するための総合的な構成例である。リブ式区画線とは、車のはみ出し禁止線などに使われている凸部を有する路面標示用区画線である。本発明による装置は、道路の片側の装置の音だけで横断可能な方向を知らせることができるため、比較的小さな音で有効であり、反対側の音は聞こえる必要がない。そのため、視覚障害者は道路横断の際、正確な進行方向を把握しづらい。この点につき、従来の方法の場合、反対側の音も聞かせることにより進行方向の誘導を計っているが、実際には交差点内の 4 箇所の音が聞こえてしまうため実効性は低い。

【0018】実施例 4 は、この問題を解決するための構成例であり、歩道を歩行してきた視覚障害者は、誘導リブ式区画線 9、9 a によって歩道上を誘導され、歩道端標示リブ式区画線 9 b、9 c 上にて待機する。歩行者用信号機 2 が青になると、本発明による装置（実施例 1）により横断可能な方向を知らされ、横断歩道上に設置された横断誘導リブ式区画線 9 d、9 e の誘導に従って横断歩道 10、10 a 上を正確に横断することができる。

【0019】なお、9、9 a、9 d、9 e は、1 本の線で構成され、視覚障害者を誘導する働きをし、9 b、9 c は、2 本の線を一体として構成され、視覚障害者に注意、警告を示す働きをするものとする。

#### 【0020】

【発明の効果】本発明は、以上のような構成であるので、次のような効果が生じる。第一に、視覚障害者に対し、方角に関係なく直接的に横断可能な方向を知らせることができるので、従来のように音と横断可能方向との組合せを記憶する必要がなくなり、記憶違いによる危険が解消される。

【0021】第二に、道路の片側の装置だけで横断可能な方向を知らせることができるため、従来よりも小さな音で有効となるので、夜間において装置を停止させる必要性が減り、また、近隣住民への迷惑も軽減され普及しやすくなる。

#### 【0022】

##### 【図面の簡単な説明】

【図 1】本発明の実施例 1 である。

【図 2】本発明の実施例 2 である。

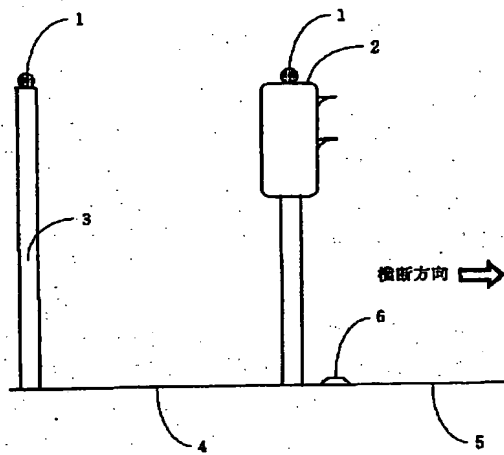
【図 3】本発明の実施例 3 である。

【図 4】本発明の実施例 4 である。

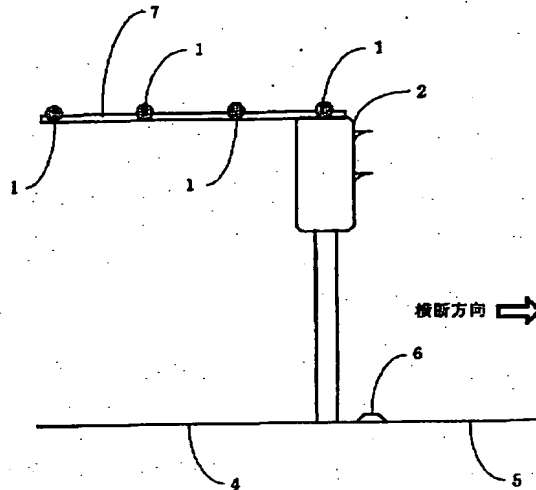
##### 【符号の説明】

- 1 音響装置
- 2 歩行者用信号機
- 3 支柱
- 4 歩道
- 5 車道
- 6 歩車道境界石
- 7 張り出し部材
- 8 受け部材
- 9 誘導リブ式区画線
- 9 a 誘導リブ式区画線
- 9 b 歩道端標示リブ式区画線
- 9 c 歩道端標示リブ式区画線
- 9 d 横断誘導リブ式区画線
- 9 e 横断誘導リブ式区画線
- 10 横断歩道線
- 10 a 横断歩道線

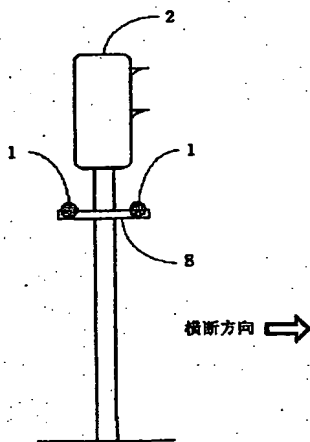
【図1】



【図2】



【図3】



【図4】

